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PILLSBURY WINTHROP SHAW PITTMAN, LLP  
P.O. BOX 10500  
MCLEAN, VA 22102

EXAMINER

KACKAR, RAM N

ART UNIT	PAPER NUMBER
1763	

1763

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/20/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claim 24 is rejected under 35 U.S.C. 102(b) as being anticipated by Mandrekar et al (US Pub 2003/0164226).**

Mandrekar et al discloses a system for controlling the temperature of multiple components in a processing chamber by circulating heat transfer fluid (Fig 2), first fluid unit (50) and second fluid unit (52) which could be heated or cooled and where the temperature control is obtained while using temperature sensors (Abstract) by controlling in a PID feed back loop, the flow of these fluid units in to a mixer (Fig 2, Fig 3 and Col 6 lines 11-37) before distributing to components.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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**4. Claims 1-13, 15, 18 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mandrekar et al (US Pub 2003/0164226).**

Mandrekar et al discloses a system for controlling the temperature of multiple components in a processing chamber by circulating heat transfer fluid (Fig 2), first fluid unit (50) and second fluid unit (52) which could be heated or cooled and where the temperature control is obtained while using temperature sensors (Abstract) by controlling in a PID feed back loop, the flow of these fluid units in to a mixer (Fig 2, Fig 3 and Col 6 lines 11-37) before distributing to components.

Mandrekar et al do not disclose controlling the temperature of a substrate holder directly. However since they teach temperature control of any component of the processing chamber, applying this teaching to a substrate holder would have been obvious.

**5. Claims 1-13, 15, 18 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reginald Hunter (US 6026896) in view of Mandrekar et al (US Pub 2003/0164226).**

Reginald Hunter discloses a system for controlling the temperature of multiple components in a processing chamber including substrate holding surface (Col 1 lines 49-54) by circulating heat transfer fluid (Fig 3), first fluid unit and second fluid unit (18 and 54) which could be heated or chilled (Abstract) and where the temperature control is obtained by controlling in a PID feed back loop, the flow of these fluid units controlled and arranged at different temperature (Col 1 line 61-Col 2 line11, Fig 3, Col 3 lines 22-26) while using

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temperature sensors (Fig 1-36). The use of such a temperature control device is in a processing chamber using CVD, PVD, plasma etching and other processing.

Reginald Hunter does not disclose alternative means of temperature control by mixing fluids of two temperatures in different proportions.

Mandrekar et al discloses a system for controlling the temperature of multiple components in a processing chamber by circulating heat transfer fluid (Fig 2), first fluid unit (50) and second fluid unit (52) which could be heated or cooled and where the temperature control is obtained while using temperature sensors (Abstract) by controlling in a PID feed back loop, the flow of these fluid units in to a mixer (Fig 2, Fig 3 and Col 6 lines 11-37) before distributing to components.

Therefore it would be obvious for one of ordinary skill in the art at the time of invention to have used temperature control by mixing temperature control fluids in different proportion in the apparatus of Hunter to get a system where smooth change of temperature would also be fast.

**6. Claims 1-5, 9-11, 14-16 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schaper et al (US 5802856) in view of Mandrekar et al (US Pub 2003/0164226).**

Schaper et al discloses a system for controlling the temperature of a substrate holding surface (Fig 3 and abstract) by circulating heat transfer fluid from plurality of fluid units (64, 66, 68) which could be heated or cooled and where the temperature control is obtained by controlling in a feed back loop, the flow of these fluid units controlled and arranged at different temperature using controller and sensors (Abstract, Fig 5 and 46, 48, 50, 52). Schaper et al

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further teach finer control of temperature using thermoelectric modules (Abstract). The substrate-holding surface could hold the substrate by electrostatic chuck or vacuum (Col 4 lines 35-40).

Schaper et al do not disclose alternative means of temperature control by mixing fluids of two temperatures in different proportions.

Mandrekar et al discloses a system for controlling the temperature of multiple components in a processing chamber by circulating heat transfer fluid (Fig 2), first fluid unit (50) and second fluid unit (52) which could be heated or cooled and where the temperature control is obtained while using temperature sensors (Abstract) by controlling in a PID feed back loop, the flow of these fluid units in to a mixer (Fig 2, Fig 3 and Col 6 lines 11-37) before distributing to components.

Therefore it would be obvious for one of ordinary skill in the art at the time of invention to have used temperature control by mixing temperature control fluids in different proportion in the apparatus of Schaper et al to get a system where smooth change of temperature would also be fast.

**7. Claims 12-14 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reginald Hunter (US 6026896) in view of Mandrekar et al (US Pub 2003/0164226) as applied to claims (1-13, 15, 18 and 21-24) and further in view of Kanno et al (US Pub 2003/0164226).**

Reginald Hunter in view of Mandrekar et al, as discussed above discloses the use of such a temperature control device in a processing chamber using CVD, PVD and plasma etching but

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does not explicitly disclose vacuum, RF and lift pins which are normally used in automated processing of semiconductor wafers as disclosed explicitly by Kanno et al (Fig 1- Fig 20).

Therefore using the disclosed temperature control device in an apparatus like disclosed by Kanno et al would have been obvious for precise and uniform temperature control of the substrate for process control and optimization.

**8. Claims 6-8 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Reginald Hunter (US 6026896) in view of Mandrekar et al (US Pub 2003/0164226) as applied to claims (1-13, 15, 18 and 21-24) and further in view of Shultz et al (US 4060997).**

Subject matter of these claims is inherent in the device disclosed by Reginald Hunter, nevertheless Shultz et al disclose a chiller with temperature sensors and fluid level sensors to keep the fluid replenished at constant level for the proper functioning of the heat exchangers. (See Fig 1 and its description).

Therefore subject matter of these claims would have been obvious to one of ordinary skill in the art at the time of invention in order to ensure proper functioning of the heat exchangers.

### ***Response to Arguments***

Applicant's arguments filed 1/17/2007 have been fully considered but they are not persuasive.

Applicants arguments related to amended feature of mixer are moot in view of new grounds of rejection.

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***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Ram Kackar  
Primary Examiner AU 1763